Intensive Computation

14th march 2014

Exercise 1

Write a script that:

- Create a matrix A nxn, with n>10, consisiting of random values in the interval [100,199]
- Generate two random indices h and k such that 1<h<n/2 and n/2≤k<n.
- Create a matrix B (n-2)xn, as a null element matrix, and copy in B the rows of A eliminating row h and row k, whitout modifying matrix A.

Exercise 2

- Write the **function ExtractRows** that extracts k rows from a given matrix starting from a given index i and return the k rows in a matrix K
- Write a **script** that create a matrix of random integer values in the interval [100,130] and swap k rows selected by calling the function **ExtractRows** with the last k rows
- **remark** avoid superimposition of the sets of rows that are swapped by imposing limitations to the value of k and the index i

Exercise 3

- Write a script that plot y1=sin x, y2=sin(x+.4), y2=sin(x+.8) and y2=sin(x+1.2) in the same window, including the legend, the name of the axis and the name of the figure.
- Generalise the previous script by plotting
    - n functions sin by increasing the angle of 0.2
    - by choosing n different colors in a vector
    - by adding the legend that show the line color associated with sin of the corresponding value of the angle

Exercise 4

Use `meshgrid` to obtain the 3-D representation of the function $f(x,y) = \frac{2xy}{(x^2+y^2)}$ where (x,y)∈[1,3]x[1,3] and the scale grid is equal to 0,1.

Visualise the graph in different sub-windows by using the statements `mesh`, `surf`, `surfl` and `contour`.

Try different functions and different scale values.